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How data science in and for Africa can blaze new trails

By Wim Delva

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The term "data science" was coined by scientists working at the social networks LinkedIn and Facebook in 2008. A few years later, they dubbed it "the sexiest profession of the 21st century".

Image source: Gallo/Getty.

This relatively new, interdisciplinary field is a blend of statistics, computer science, mathematics, engineering and subject matter knowledge. In fact, any and all subjects qualify. Its proponents believe it will transform every aspect of society. Many of the disruptive, game-changing innovations that are grounded in data science are intended to improve people's quality of life as well as the efficiency of processes and services. Examples include autonomous vehicles; precision medicine and precision agriculture; smart cities and financial technology.

Over the past decade, virtually every university in Europe and North America has responded to the challenges and opportunities of data science by establishing new institutes, departments and degree programmes in the field.

Academic institutions in Africa have only recently begun to catch up. Some are creating structures, networks and training programmes to stimulate research and capacity development in the subject. Examples include the African Center of Excellence in Data Science in Rwanda, the AI & Data Science Research Group at Makerere University in Uganda, Data Science Africa, and the Deep Learning Indaba. But with a time lag of at least half a decade, the question is whether Africa is bound to be trailing behind.

As the acting director of the new School for Data Science and Computational Thinking at Stellenbosch University in South Africa, I would argue that the answer is a resounding no. If African universities are mindful of the continent's specific needs and realities, they have a unique opportunity to blaze new trails in what is still largely uncharted territory.

These opportunities lie particularly in two areas. The first involves creating data science programmes for people who aren't on campus. The second relates to partnering with governments and businesses to address Africa's most important societal challenges and capitalise on opportunities for economic growth.

Mobile access

Less than 10% of people younger than 25 have access to higher education in Sub-Saharan Africa.

It is not that the continent's youth are uninterested in a higher education degree. Many are simply unable to afford full-time on-campus studies. So, if students can't come to the university, the university must come to the students. The internet and a myriad of innovative distance learning platforms make this possible.

Only 40% of Africa's population has access to the internet. That's compared to 61% for the rest of the world. But the internet penetration rate is increasing faster on the continent than anywhere else. Bite-size online content can be taken as standalone modules or cumulated into a certified degree. Either way, online distance education formats can be offered at a lower cost. They are also more scalable than traditional classroom teaching.

In this way, Africa's youth has the chance to earn a degree while maintaining informal or formal employment. This makes it a financially viable proposition. They can also stay physically connected to their social networks of families and friends. This is important in preventing internal brain drains and exacerbating socio-economic disparities within and between African countries.

Data science lends itself particularly well to being taught through online learning programmes. This is because thriving in a virtual classroom requires the same creative, solution-oriented mindset that characterises the best data scientists. And much of the programme's content – like managing and analysing data, writing code and deploying software solutions – happens from behind a laptop which is connected to the Cloud anyway.

Large corporates are another possible target audience. Many are eager to use data science to extract more value out of the data they've been collecting. The Vitality programme is a prime example. The South African insurance company Discovery uses trackers of physical activity, healthy grocery shopping and driving behaviour to incentivise healthy living and safe driving.

However, many companies lack the internal capacity to make their business model more data-driven. They could improve the situation by partnering with academic institutions to develop shorter term online and blended learning programmes for staff in particular departments.

These partnerships benefit everyone. Importantly, they also mean that the business and academic environments can share the risk of developing new learning materials and maximise these programmes' relevance to the real world.

Data science in Africa, for Africa

There's another vital area where African data science could surge out in front.

It is human nature to focus on immediate, locally perceived problems before venturing into fixing more remote ones. So people and organisations from elsewhere in the world may not always identify and try to tackle the African continent's problems. These issues include improving access and equity in health care; improving road safety and bolstering food security.

Data science, led by Africa-based scientists, could play a key role in addressing all of these needs. That's not to say collaborations with overseas partners should be discarded. These bring complementary expertise; avoid reinventing the wheel, and make it possible to make larger investments and ultimately have a bigger impact.

But local academics should take the lead in developing data-driven solutions to local challenges. They understand the social, cultural and political contexts. They are connected to the government departments, non-profit organisations and businesses that can put theoretical models into practice.

Solutions and service

My colleagues and I at the school – launched officially on July 29 – are excited to join the growing network of universities in Africa that are training the data scientists who will help shape the continent's future. That future is one of ever-changing data, analytics and computer infrastructure. So our focus will be on teaching and practising data science in interdisciplinary joint ventures with partners in academia, industry and government. In this way we can design, test, validate and scale up home-grown, future-proof solutions and services to Africa's challenges and business opportunities.

ABOUT THE AUTHOR

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